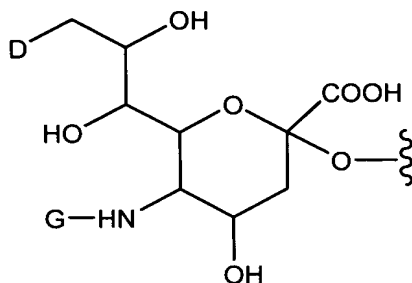


**WHAT IS CLAIMED IS:**

- 1    **1.**    A Factor IX peptide comprising at least one moiety having the formula:



2

3    wherein

4            D is a member selected from -OH and R<sup>1</sup>-L-HN-;

5            G is a member selected from R<sup>1</sup>-L- and -C(O)(C<sub>1</sub>-C<sub>6</sub>)alkyl;

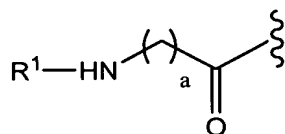
6            R<sup>1</sup> is a moiety comprising a member selected a straight-chain or branched  
7            poly(ethylene glycol) residue; and

8            L is a linker which is a member selected from a bond, substituted or unsubstituted  
9            alkyl and substituted or unsubstituted heteroalkyl,

10          such that when D is OH, G is R<sup>1</sup>-L-, and when G is -C(O)(C<sub>1</sub>-C<sub>6</sub>)alkyl, D is

11          R<sup>1</sup>-L-NH-.

- 1    **2.**    The Factor IX peptide according to claim 1, wherein L-R<sup>1</sup> has the formula:



2

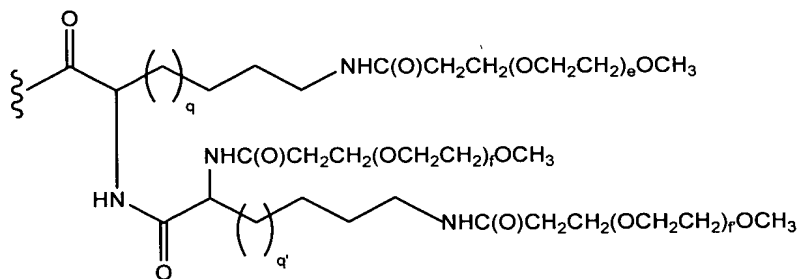
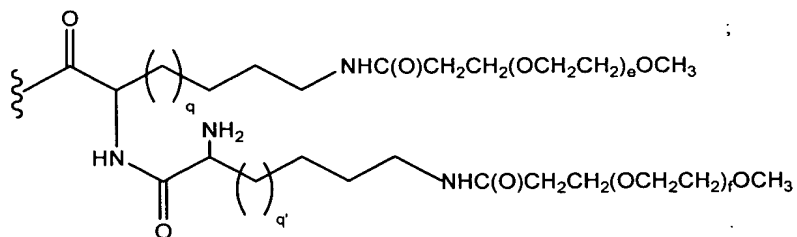
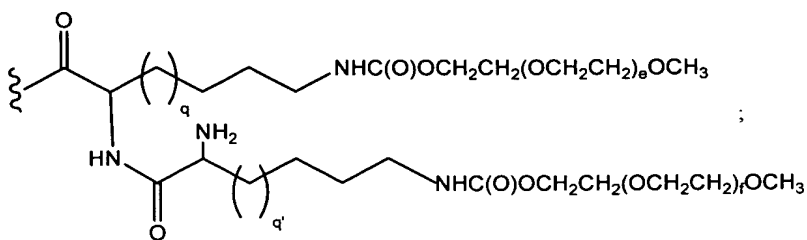
3    wherein

4            a is an integer from 0 to 20.

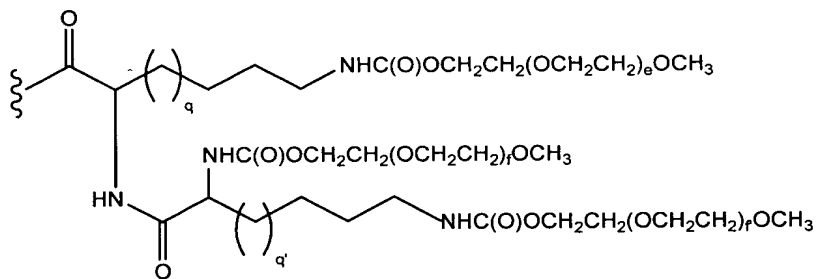
- 1    **3.**    The Factor IX peptide according to claim 1, wherein R<sup>1</sup> has a structure that is a  
2    member selected from:



$q$  is an integer from 0 to 20.



and



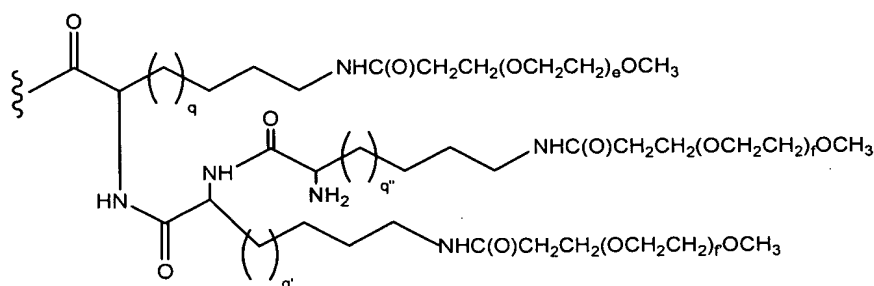
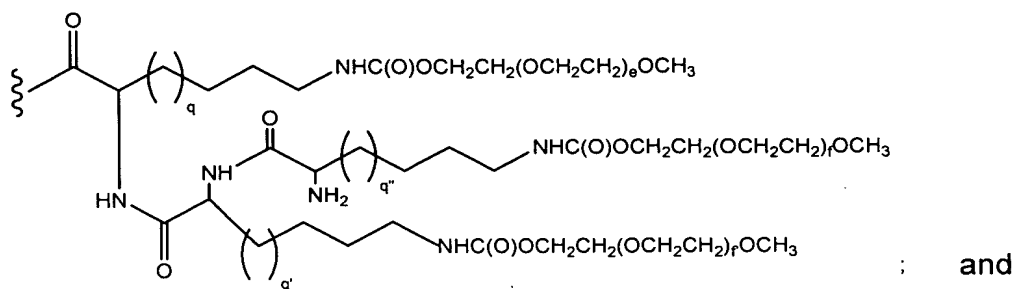
3

4 wherein

5 e, f and f' are integers independently selected from 1 to 2500; and

6 q and q' are integers independently selected from 1 to 20.

5. The Factor IX peptide according to claim 1, wherein R<sup>1</sup> has a structure that is a member selected from:

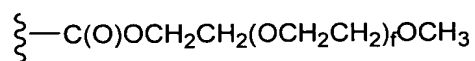


wherein

e, f and f' are integers independently selected from 1 to 2500; and

q, q' and q'' are integers independently selected from 1 to 20.

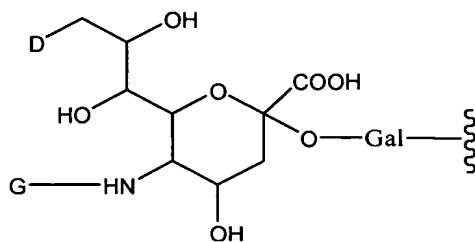
6. The Factor IX peptide according to claim 1 wherein R<sup>1</sup> has a structure that is a member selected from:



wherein

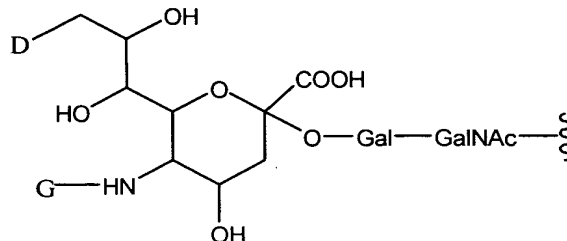
e and f are integers independently selected from 1 to 2500.

7. The Factor IX peptide according to claim 1, wherein said moiety has the formula:



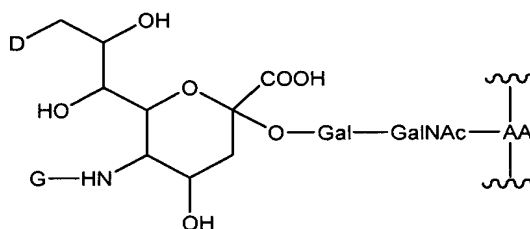
2

- 1 **8.** The Factor IX peptide according to claim 1, wherein said moiety has the formula:



2

- 1 **9.** The Factor IX peptide according to claim 1, wherein said moiety has the formula:



2

3 wherein

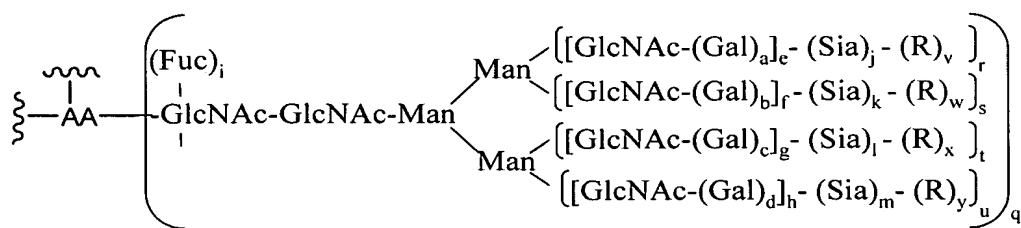
4 AA is an amino acid residue of said peptide.

- 1 **10.** The Factor IX peptide according to claim 9, wherein said amino acid residue is a  
2 member selected from serine or threonine.

- 1 **11.** The Factor IX peptide according to claim 1, wherein said peptide has the amino acid  
2 sequence of SEQ. ID. NO:1.

- 1 **12.** The Factor IX peptide according to claim 11, wherein said amino acid residue is  
2 serine at position 61 of SEQ. ID. NO:1.

- 1 **13.** The Factor IX peptide according to claim 1, wherein said moiety has the formula:



wherein

a, b, c, d, i, r, s, t, and u are integers independently selected from 0 and 1;

q is 1;

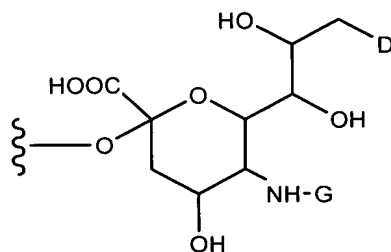
e, f, g, and h are members independently selected from the integers from 0 to 6;

j, k, l, and m are members independently selected from the integers from 0 and 100;

v, w, x, and y are independently selected from 0 and 1, and least one of v, w, x and y is 1;

AA is an amino acid residue of said Factor IX peptide;

Sia-(R) has the formula:



wherein

D is a member selected from -OH and  $\text{R}^1\text{-L-HN-}$ ;

G is a member selected from  $\text{R}^1\text{-L-}$  and  $\text{-C(O)(C}_1\text{-C}_6\text{)alkyl}$ ;

$\text{R}^1$  is a moiety comprising a member selected a straight-chain or branched poly(ethylene glycol) residue; and

L is a linker which is a member selected from a bond, substituted or

unsubstituted alkyl and substituted or unsubstituted heteroalkyl,

such that when D is OH, G is  $\text{R}^1\text{-L-}$ , and when G is  $\text{-C(O)(C}_1\text{-C}_6\text{)alkyl}$ , D is

$\text{R}^1\text{-L-NH-}$ .

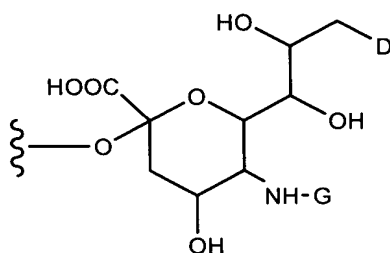
1 14. The Factor IX peptide according to claim 7, wherein said glycosyl residue is attached  
2 to a member selected from Asn 157, Asn 167 and combinations thereof.

1 15. A pharmaceutical formulation comprising the Factor IX according to claim 1 and a  
2 pharmaceutically acceptable carrier.

1 16. A method of stimulating blood coagulation in a mammal, said method comprising  
2 administering to said mammal said Factor IX peptide according to claim 1.

1 17. A method of treating hemophilia in a subject, said method comprising administering  
2 to said subject said Factor IX peptide according to claim 1.

1 18. A method of making a Factor IX peptide conjugate comprising the moiety:



3 wherein

4 D is a member selected from -OH and  $R^1$ -L-HN-;

5 G is a member selected from  $R^1$ -L- and  $-C(O)(C_1-C_6)$ alkyl;

6  $R^1$  is a moiety comprising a member selected a straight-chain or branched  
7 poly(ethylene glycol) residue; and

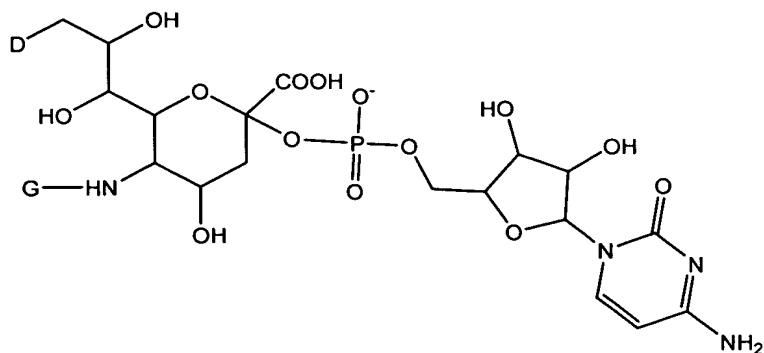
8 L is a linker which is a member selected from a bond, substituted or unsubstituted  
9 alkyl and substituted or unsubstituted heteroalkyl,

10 such that when D is OH, G is  $R^1$ -L-, and when G is  $-C(O)(C_1-C_6)$ alkyl, D is

11  $R^1$ -L-NH-,

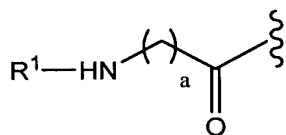
12 said method comprising:

13 (a) contacting a substrate Factor IX peptide with a PEG-sialic acid donor moiety  
14 having the formula:



and an enzyme that transfers said PEG-sialic acid onto an amino acid or glycosyl residue of said Factor IX peptide, under conditions appropriate for the transfer.

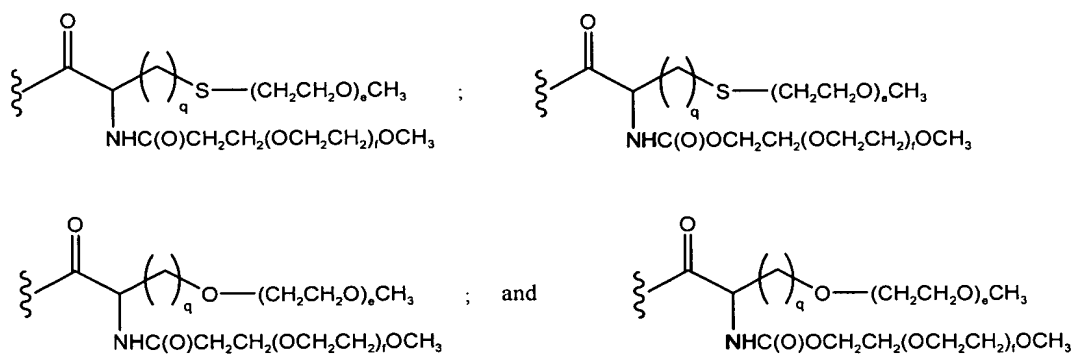
19. The method according to claim 18, wherein L-R<sup>1</sup> has the formula:



wherein

a is an integer from 0 to 20.

20. The method according to claim 18, wherein R<sup>1</sup> has a structure that is a member selected from:



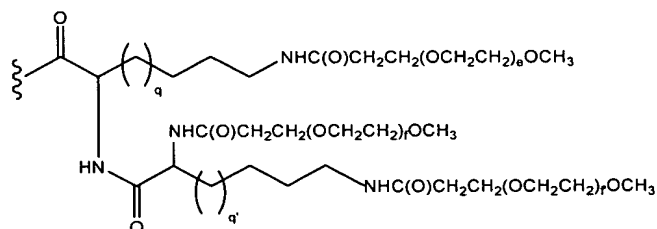
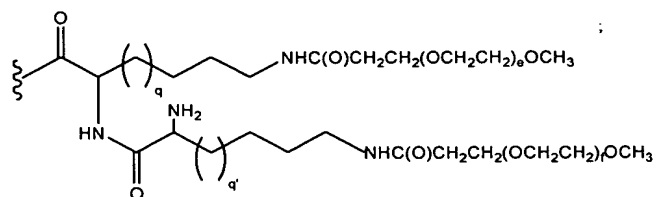
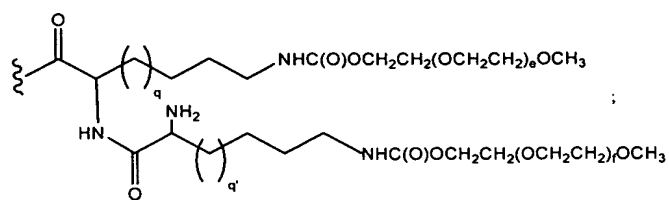
wherein

e and f are integers independently selected from 1 to 2500; and

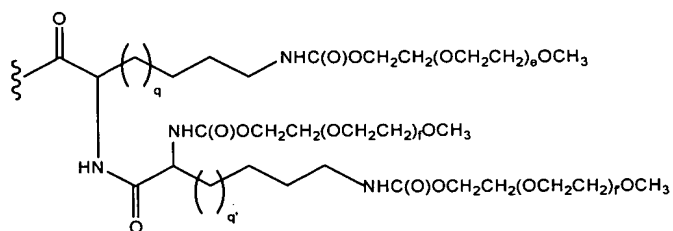
q is an integer from 0 to 20.

21. The method according to claim 18, wherein R<sup>1</sup> has a structure that is a member selected from:





and



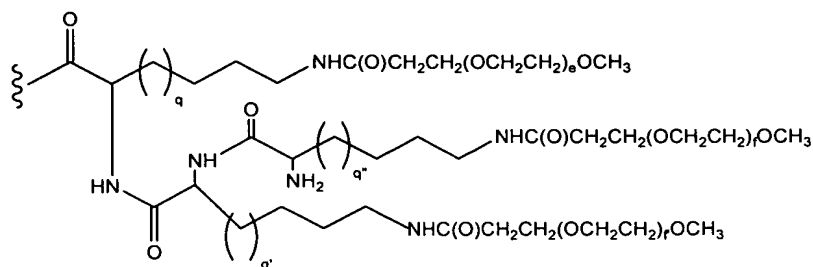
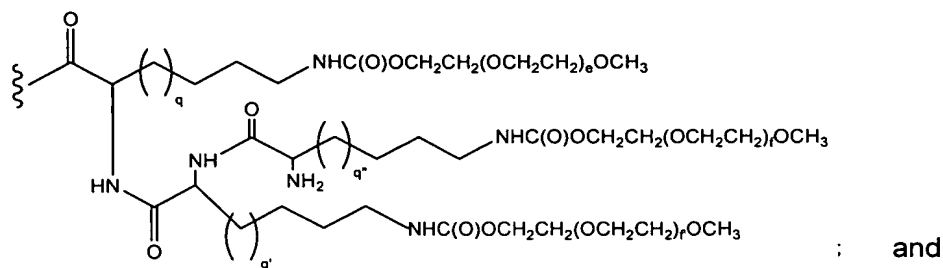
3

4 wherein

5 e, f and f' are integers independently selected from 1 to 2500; and

6 q and q' are integers independently selected from 1 to 20.

- 1    **22.**    The method according to claim **18**, wherein R<sup>1</sup> has a structure that is a member  
 2    selected from:



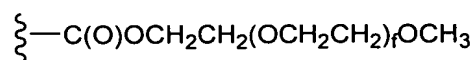
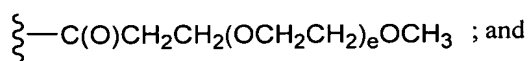
3

4    wherein

5            e, f and f' are integers independently selected from 1 to 2500; and

6            q, q' and q'' are integers independently selected from 1 to 20.

- 1    **23.**    The method according to claim **18** wherein R<sup>1</sup> has a structure that is a member  
 2    selected from:

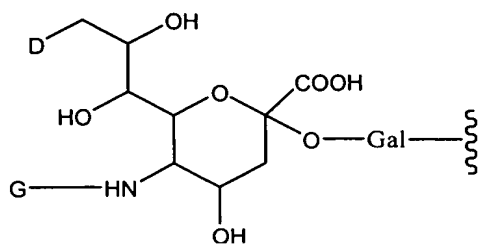


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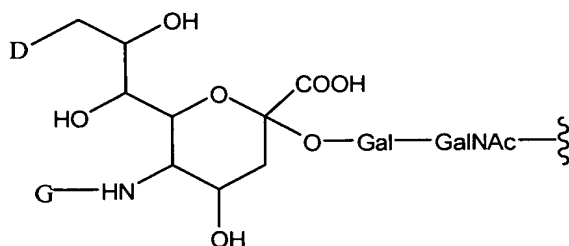
4    wherein

5            e and f are integers independently selected from 1 to 2500.

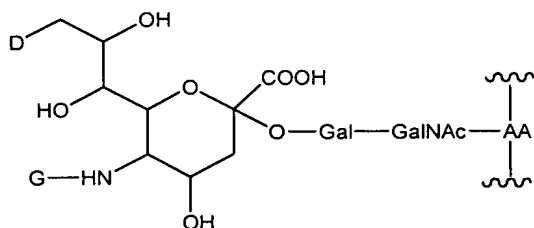
- 1    **24.**    The method according to claim **18**, wherein said Factor IX peptide conjugate  
 2    comprises a moiety having the formula:



**25.** The method according to claim **18**, wherein said Factor IX peptide conjugate comprises a moiety having the formula:



**26.** The method according to claim **18**, wherein said factor IX peptide conjugate comprises a moiety having the formula:



wherein

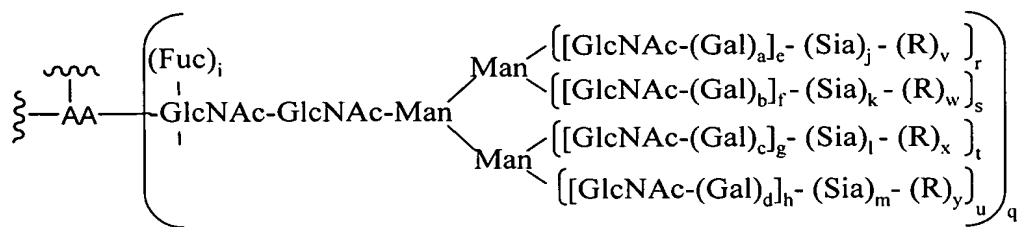
AA is an amino acid residue of said Factor IX peptide.

**27.** The method according to claim **26**, wherein said amino acid residue is a member selected from serine or threonine.

**28.** The method according to claim **18**, wherein said factor IX substrate peptide has the amino acid sequence of SEQ. ID. NO:1.

**29.** The Factor IX peptide according to claim **28**, wherein said amino acid residue is serine at position 61 of SEQ. ID. NO:1.

**30.** The method according to claim **18**, wherein said Factor IX conjugate comprises a glycosyl residue having the formula:



wherein

a, b, c, d, i, r, s, t, and u are integers independently selected from 0 and 1;

q is 1;

e, f, g, and h are members independently selected from the integers from 0 to 6;

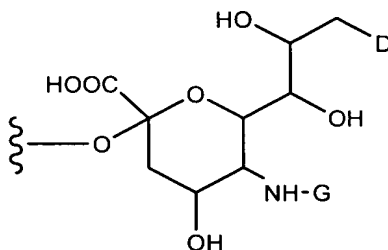
j, k, l, and m are members independently selected from the integers from 0 and 100;

v, w, x, and y are independently selected from 0 and 1, and at least one of v, w, x, and

y is 1;

AA is an amino acid residue of said Factor IX peptide;

Sia-(R) has the formula:



wherein

D is a member selected from -OH and R<sup>1</sup>-L-HN-;

G is a member selected from R<sup>1</sup>-L- and -C(O)(C<sub>1</sub>-C<sub>6</sub>)alkyl;

R<sup>1</sup> is a moiety comprising a member selected a straight-chain or branched poly(ethylene glycol) residue; and

L is a linker which is a member selected from a bond, substituted or

unsubstituted alkyl and substituted or unsubstituted heteroalkyl,

such that when D is OH, G is R<sup>1</sup>-L-, and when G is -C(O)(C<sub>1</sub>-C<sub>6</sub>)alkyl, D is

R<sup>1</sup>-L-NH-.

1   **31.**    The method according to claim **30**, wherein said glycosyl residue is attached to a  
2   member selected from Asn 157, Asn 167 and combinations thereof.

1   **32.**    The method of claim **18**, further comprising, prior to step (a):

2           (b) expressing said substrate Factor IX peptide in a suitable host cell.

1   **33.**    The method of claim **32**, wherein said host is selected from an insect cell and a  
2   mammalian cell.